

EIA's Energy Outlook 2016



CFA Society of Washington

October 13, 2016 | Washington, D.C.

by

Adam Sieminski, Administrator

Key takeaways from AEO2016

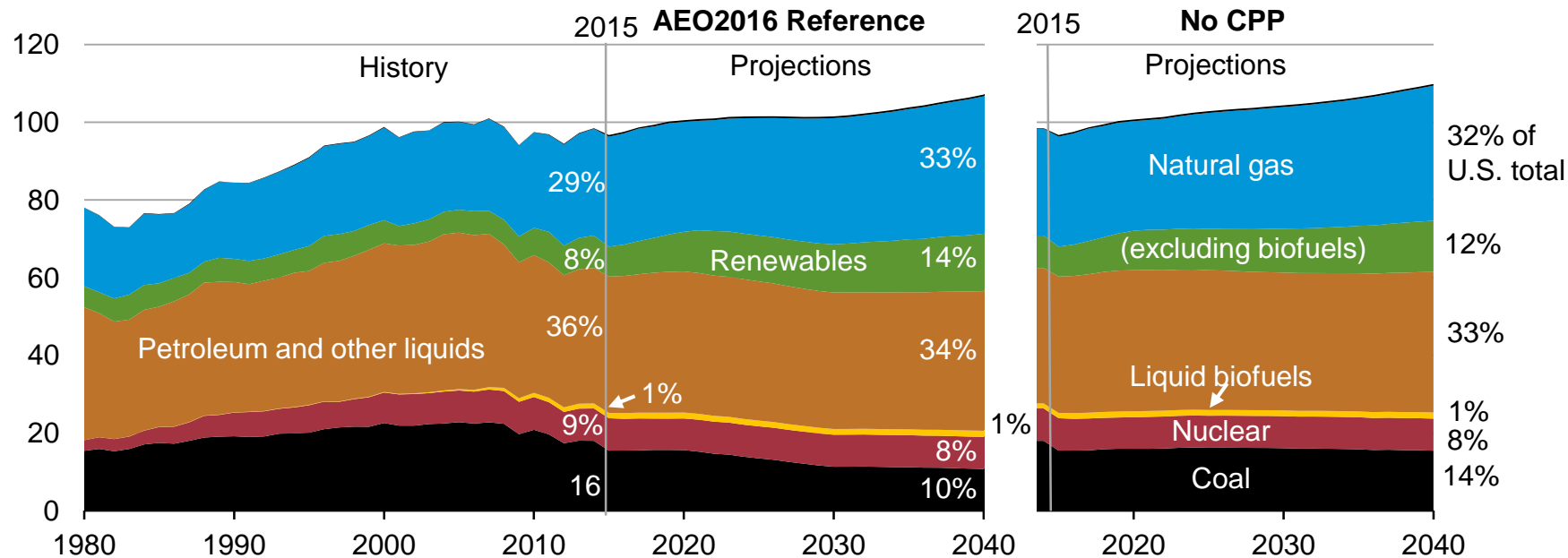
- Energy use per dollar of Gross Domestic Product declines through 2040 allowing for economic growth without upward pressure on energy consumption and related emissions
- Market forces drive up oil prices throughout the projection and U.S. production increases in response
- Natural gas production increases despite relatively low and stable natural gas prices
- Technological improvements are key drivers of U.S. oil and gas production
- Net exports of liquefied natural gas range between 3.5 Tcf and 10.6 Tcf in 2040 depending on relative prices in foreign markets
- EPA's proposed medium and heavy-duty vehicle Phase 2 standards would increase fuel economy, resulting in 18% lower diesel consumption in 2040 compared with the Reference case

Key takeaways from AEO2016 (continued)

- EPA's Clean Power Plan (CPP) requires states to reduce carbon dioxide emissions from existing fossil generators:
 - Details of the CPP implementation strategies selected by the states affect the overall generation mix, as well as consumer prices
 - CPP effects on coal production vary across regions
 - CPP, along with renewable tax credit extension and lower natural gas prices, contributes to a shift in the generation mix, with increases in generation from natural gas and renewables and reduced coal generation
 - Even if the CPP is not implemented, key factors combine to support a transition from coal to natural gas as the predominant fuel for electric generation
- Extending or expanding existing laws and regulations, including efficiency policies for appliances and vehicles, the CPP, and EPA's proposed Phase 2 standards for medium- and heavy-duty trucks results lower energy consumption and CO2 emissions than projected in the Reference case

Reductions in energy intensity largely offset impact of gross domestic product (GDP) growth, leading to slow projected growth in energy use

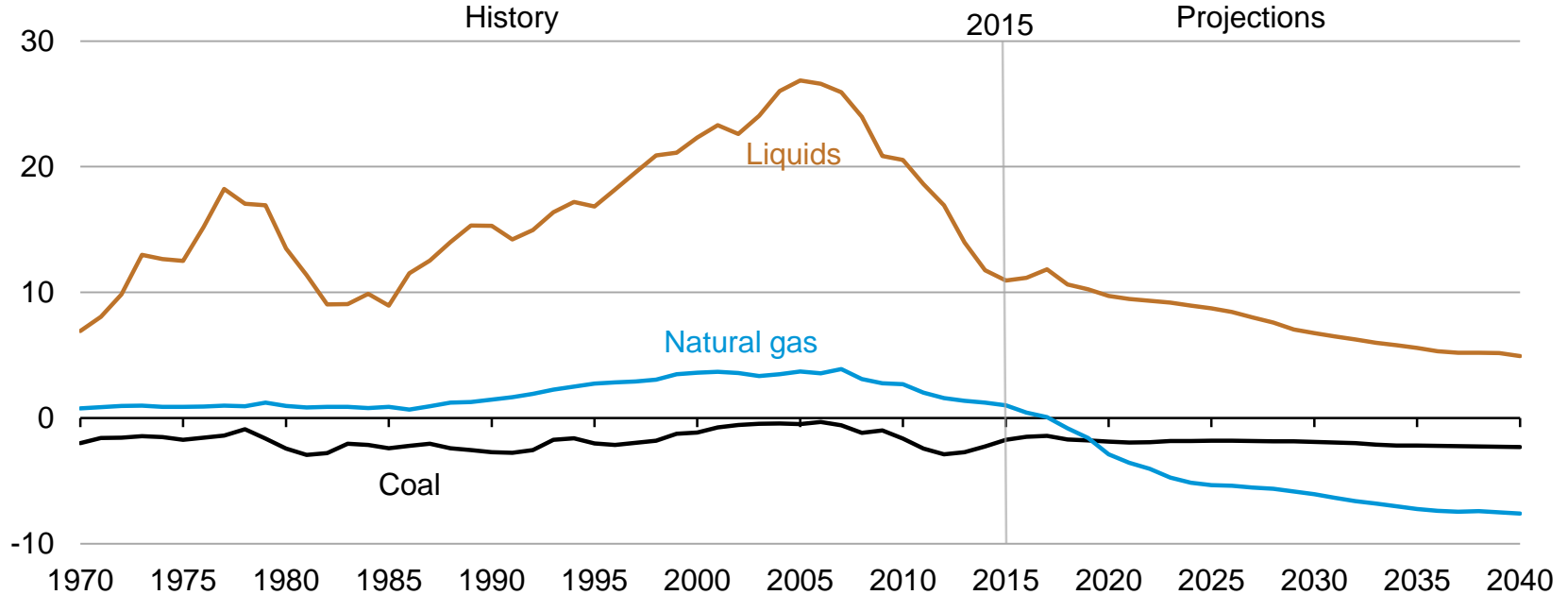
U.S. primary energy consumption
quadrillion Btu



Source: EIA, Annual Energy Outlook 2016

U.S. net energy imports trend downward, reflecting increased oil and natural gas production coupled with slowly growing or falling demand

U.S. net imports
quadrillion Btu

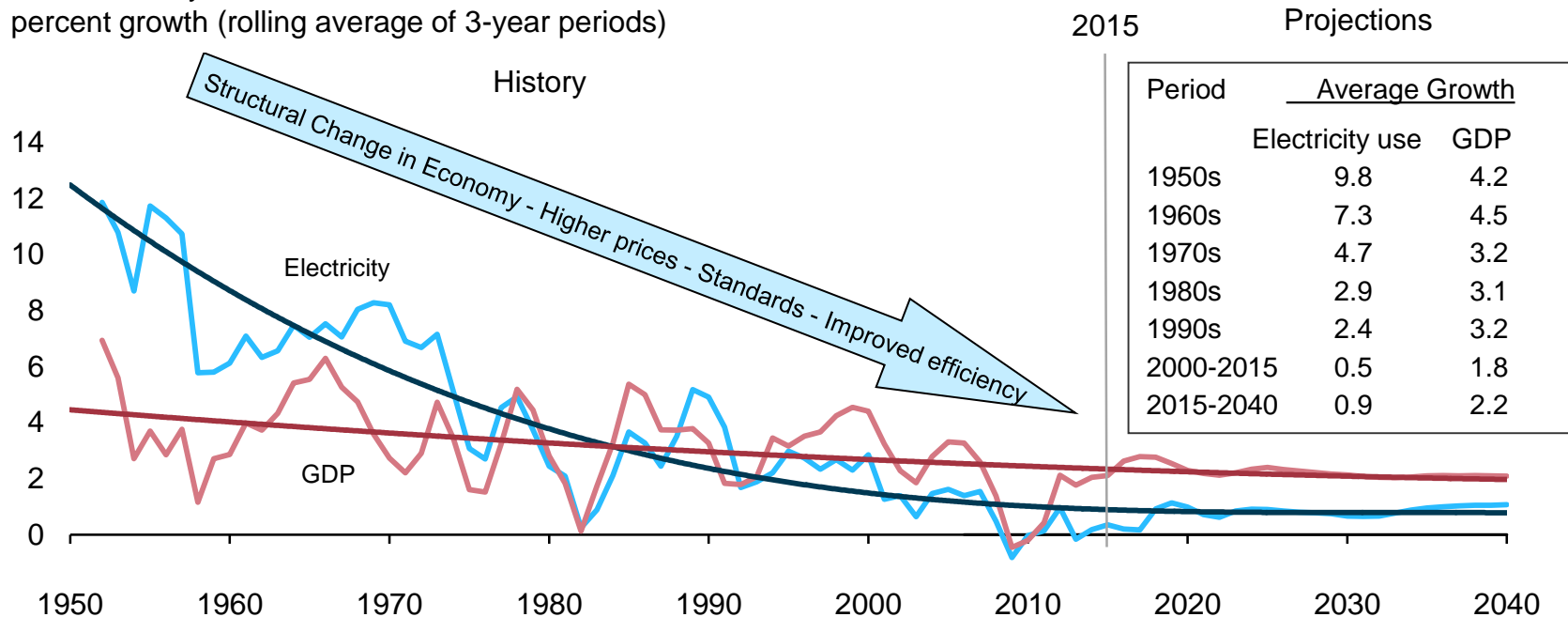


Source: EIA, Annual Energy Outlook 2016

Electricity

Electricity use (including direct use) continues to grow, but the rate of growth slows as it has almost continuously over the past 60 years

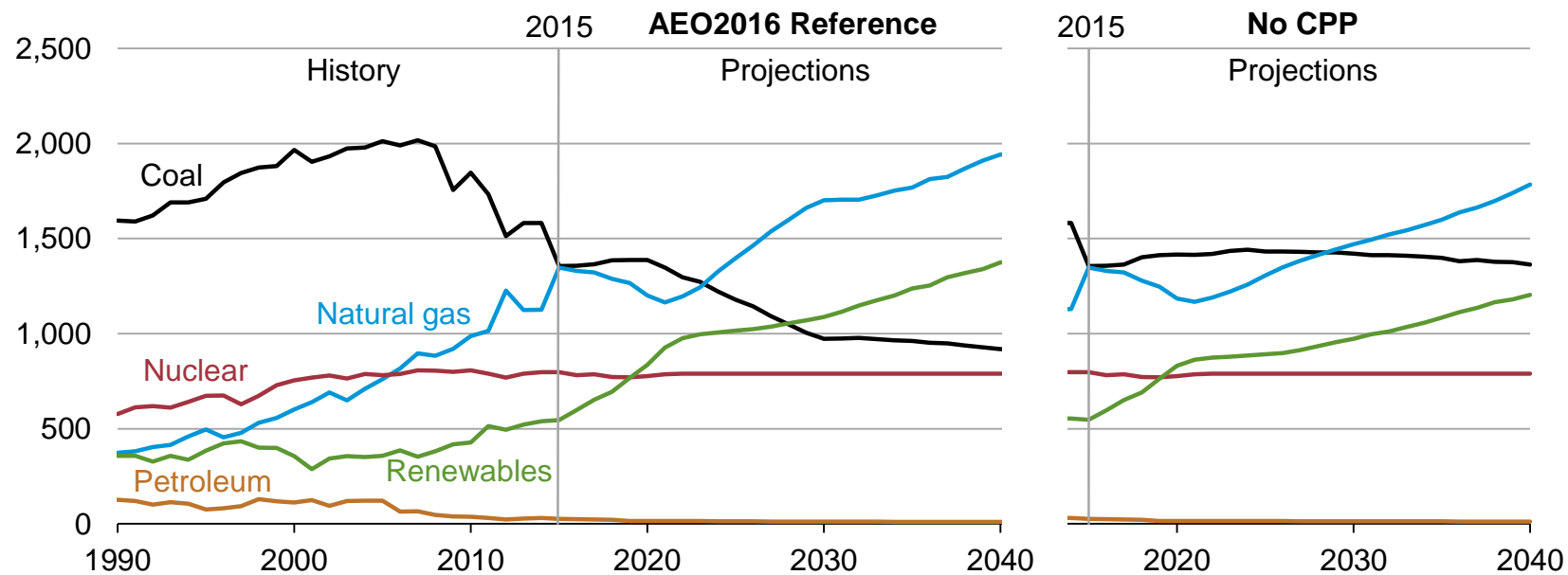
U.S. electricity use and GDP
percent growth (rolling average of 3-year periods)



Source: EIA, Annual Energy Outlook 2016

Both natural gas and renewable generation surpass coal by 2030 in the Reference case, but only natural gas does so in the No CPP case

net electricity generation
billion kilowatthours

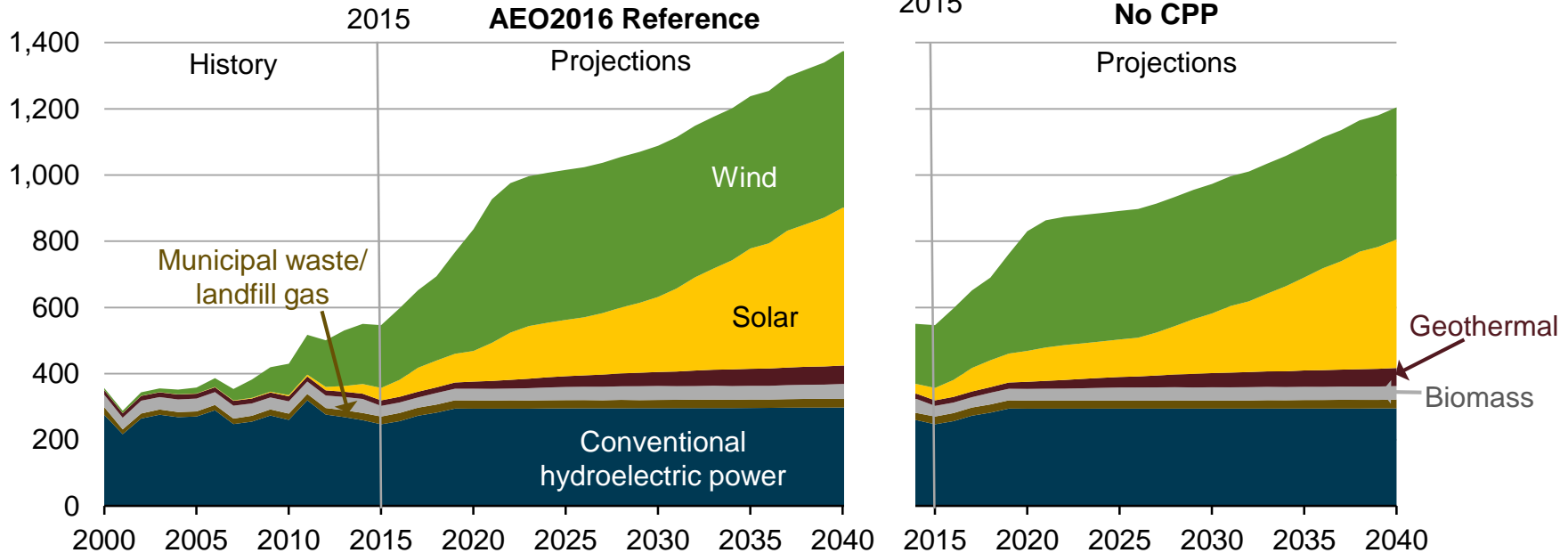


Source: EIA, Annual Energy Outlook 2016

Changing tax and cost assumptions contribute to stronger solar growth, with the CPP providing a boost to renewables

renewable electricity generation by fuel type

billion kilowatthours

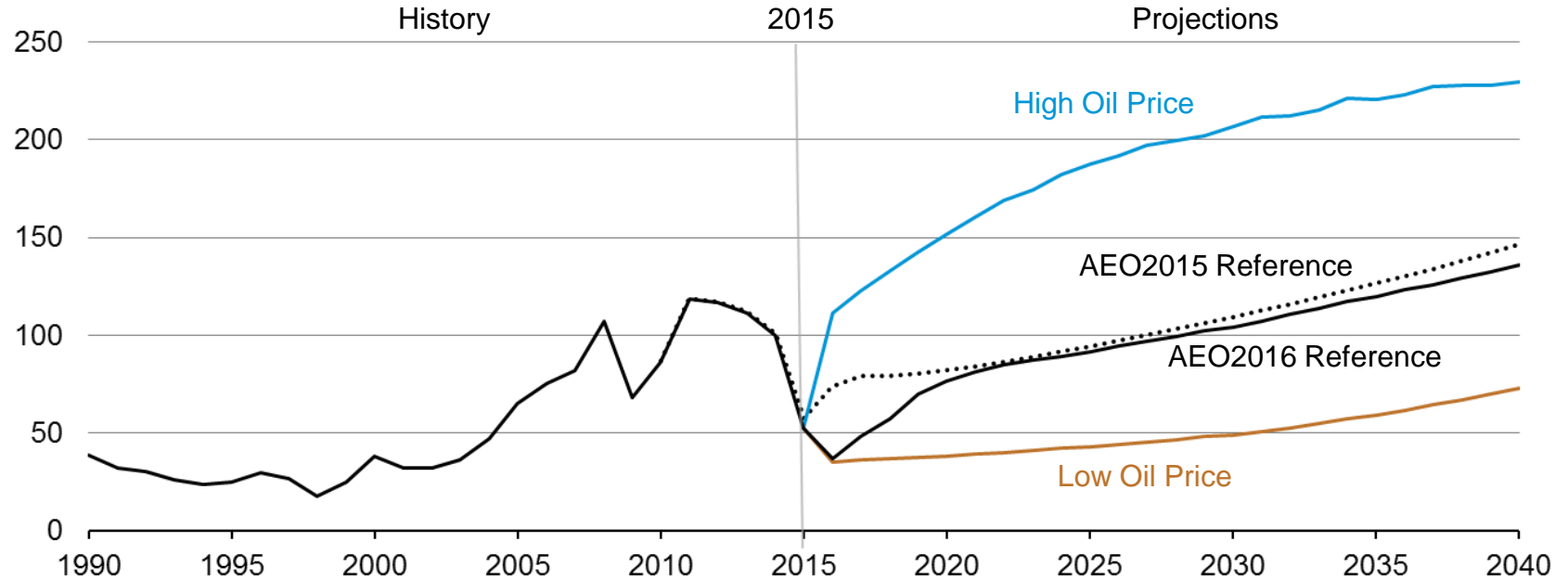


Source: EIA, Annual Energy Outlook 2016

Petroleum and other liquids

Near-term crude oil price scenario is lower in AEO2016

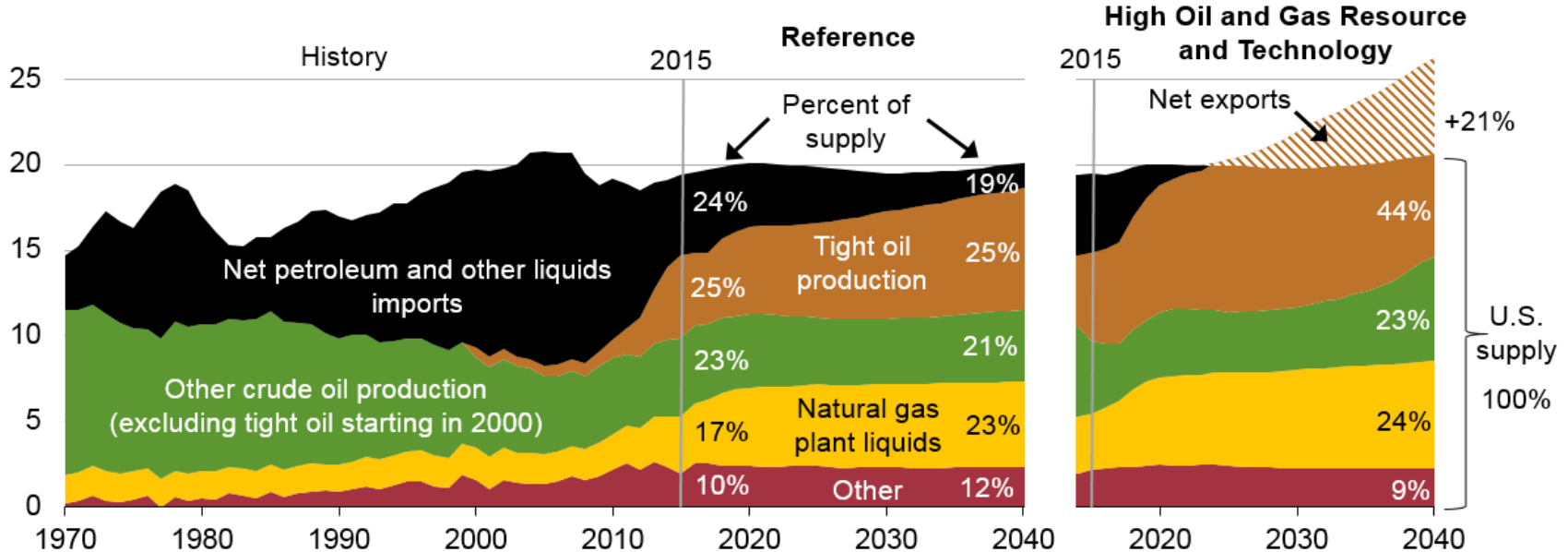
Brent crude oil spot price
2015 dollars per barrel



Source: EIA, Annual Energy Outlook 2016 Reference case and Annual Energy Outlook 2015 Reference case

Combination of increased tight oil production and higher fuel efficiency drives projected decline in oil imports

U.S. liquid fuels supply
million barrels per day

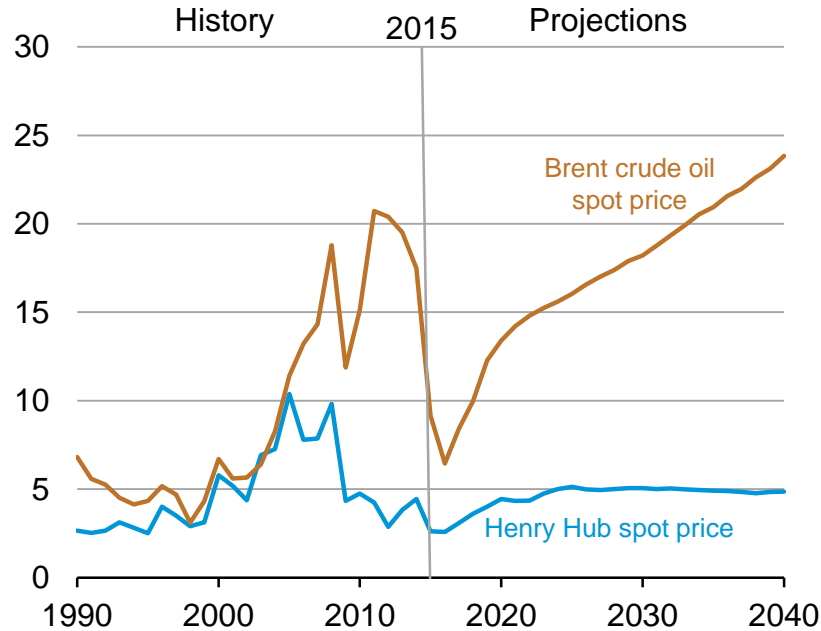


Note: "Other" includes refinery gain, biofuels production, all stock withdrawals, and other domestic sources of liquid fuels

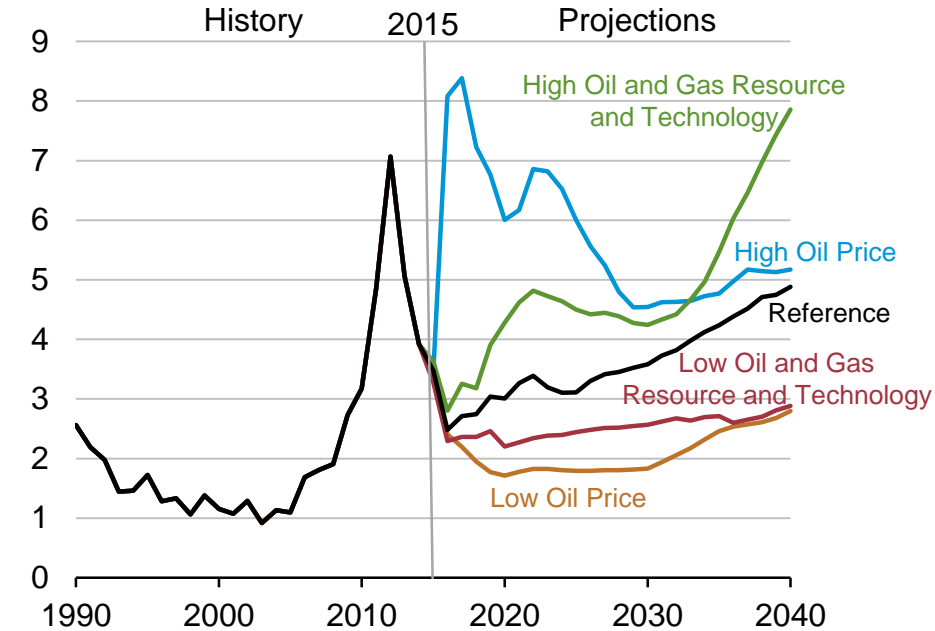
Source: EIA, Annual Energy Outlook 2016

The price relationship between crude oil and natural gas impacts producer economics and production levels for both commodities

energy spot prices under Reference case
2015 dollars per million Btu



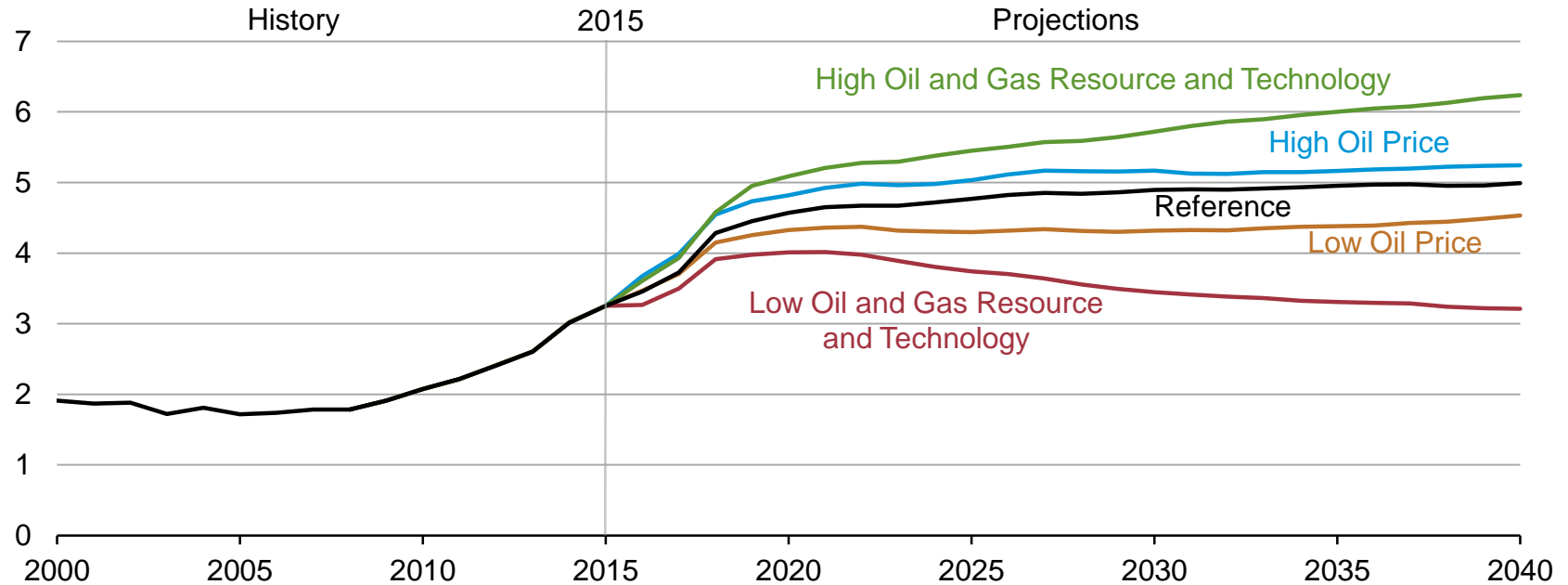
oil-to-gas price ratio



Source: EIA, Annual Energy Outlook 2016

Future domestic natural gas plant liquids production depends on both domestic resource endowment and world crude oil prices

U.S. total natural gas plant liquids production
million barrels per day



Source: EIA, Annual Energy Outlook 2016

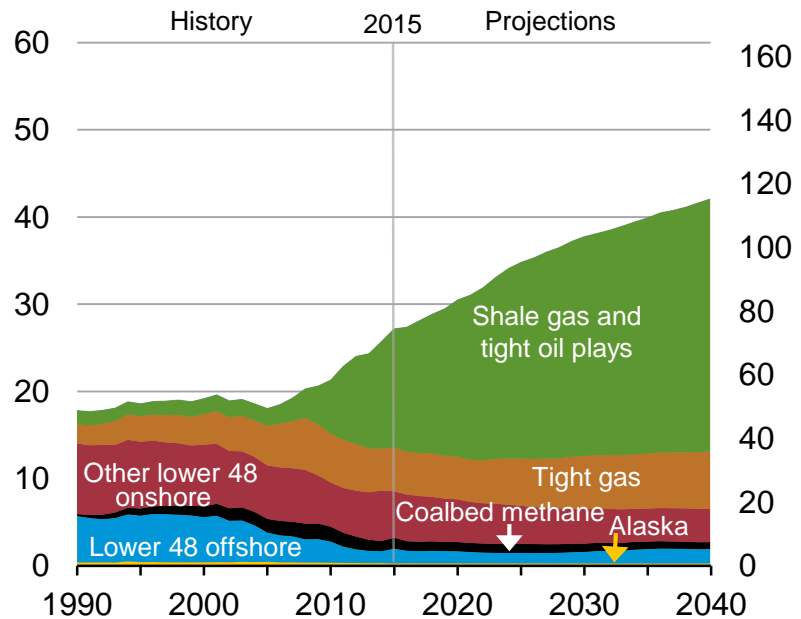
Natural gas

U.S. natural gas production dominated by shale resources; alternative price and resource /technology assumptions could be quite different

U.S. dry natural gas production

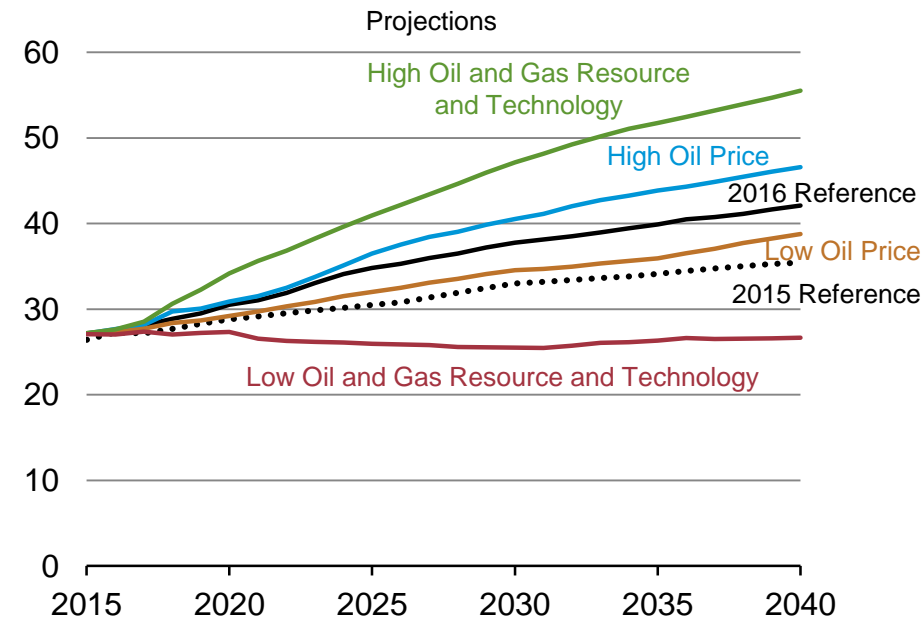
trillion cubic feet

billion cubic feet per day



U.S. dry natural gas production

trillion cubic feet

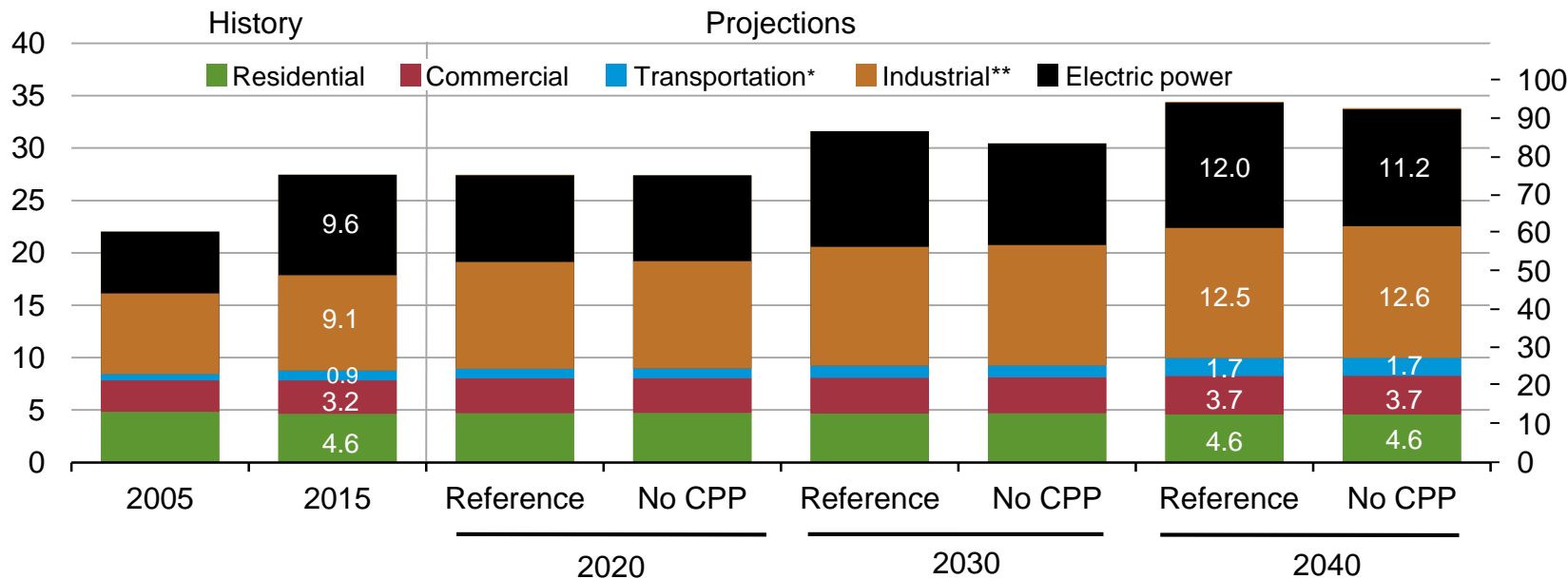


Source: EIA, Annual Energy Outlook 2016

Natural gas consumption growth is led by electricity generation and industrial uses; natural gas use rises in all sectors except residential

U.S. dry gas consumption
trillion cubic feet

billion cubic feet per day



Source: EIA, Annual Energy Outlook 2016

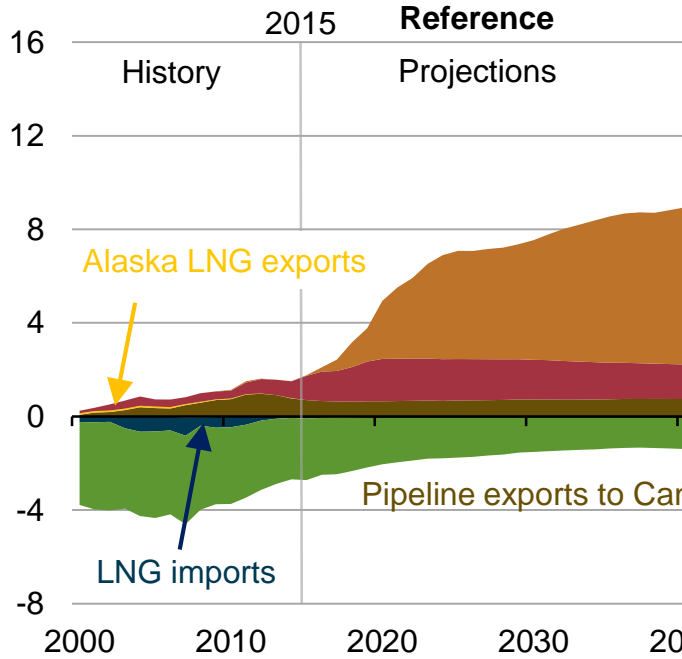
*Includes pipeline fuel

**Includes combined heat-and-power and lease, plant, and export liquefaction fuel

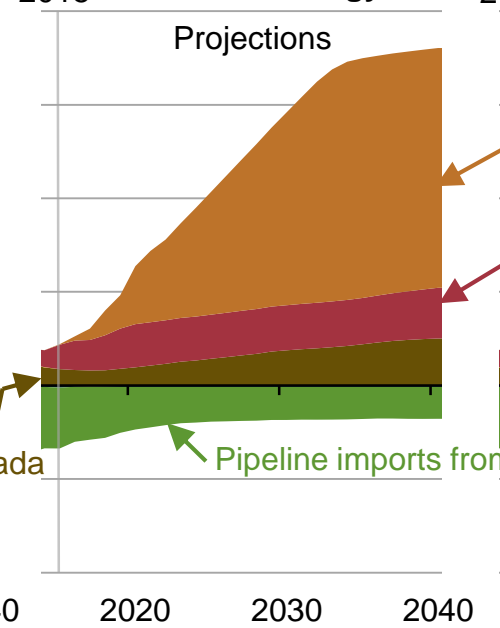
Projected U.S. natural gas exports reflect the spread between domestic natural gas prices and world energy prices

U.S. natural gas imports and exports

trillion cubic feet

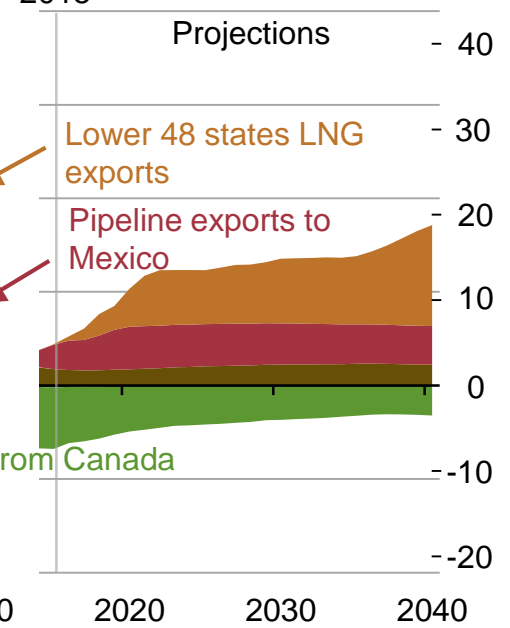


High Oil and Gas Resource and Technology



billion cubic feet per day

Low Oil Price



Source: EIA, Annual Energy Outlook 2016

For more information

U.S. Energy Information Administration home page | www.eia.gov

Annual Energy Outlook | www.eia.gov/forecasts/aeo

Short-Term Energy Outlook | www.eia.gov/forecasts/steo

International Energy Outlook | www.eia.gov/forecasts/ieo

Today In Energy | www.eia.gov/todayinenergy

Monthly Energy Review | www.eia.gov/totalenergy/data/monthly

State Energy Portal | www.eia.gov/state